



**Enbridge Pipelines Inc.**

**Line 9B Reversal and Line 9 Capacity Expansion Project**

**GROUND PATROL PLAN**

**Filed pursuant to Condition 4(a) of Order MO-045-2015**

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## 1. INTRODUCTION

On June 18, 2015, the National Energy Board (“NEB” or “Board”) issued Order MO-045-2015 and a decision letter (“June 18 Letter”) in connection with the Line 9B Reversal and Line 9 Capacity Expansion Project (the “Project”). Order MO-045-2015, in part, requires Enbridge to conduct ground patrols of each high consequence area (“HCA”) along Line 9B every two weeks to inspect for potential leaks.

The HCAs identified in Order MO-045-2015 are referred to in Enbridge’s response to NEB information request 4.10,<sup>1</sup> which was submitted on September 5, 2013. The June 18 Letter noted that the ongoing monitoring provisions in Order MO-045-2015, including this requirement for ground patrols, will enable Enbridge to proactively detect leaks and minimize their effect. This ground patrol plan fulfills the requirements of Order MO-045-2015.

Ground patrol is only one part of Enbridge’s multiple approaches to leak detection. These approaches form Enbridge’s Leak Detection Strategy and are designed to provide comprehensive and complementary leak detection capability. There are five approaches Enbridge uses to monitor its pipelines for potential leaks. Each of these approaches has a different focus, with different applications of technology, resources and timing. These methods include: 24/7 controller monitoring by Enbridge’s Control Centre of all stations, terminals, valve sites, and mainline pipelines; visual surveillance and reports (including ground patrol); scheduled line balance calculations; computational pipeline monitoring; and acoustic inline inspection. Enbridge continues to explore other technologies for use in enhancing its leak detection capabilities.

The ground patrol plan describes the ground patrol measures that are already in effect for leak detection and monitoring across Enbridge’s Line 9B pipeline and also describes the enhanced ground patrol plan that Enbridge will implement to fulfill the requirements of Order MO-045-2015. The ground patrol plan reflects Enbridge’s core values of integrity, safety and respect.

## 2. GROUND PATROL MEASURES BEFORE THE PROJECT

Prior to the Project, Enbridge’s ground patrol monitoring of the Line 9B pipeline right of way (“ROW”), included helicopter patrols and physical surveillance of stations, terminals and valve sites. The helicopter patrol covered the Line 9B ROW from North Westover to Montreal, once every two weeks. Enbridge’s technicians also conducted physical inspections of the stations and terminals at a minimum of two times per week. Remote controlled valve sites were physically inspected monthly and manually controlled valve sites were physically inspected quarterly. The entirety of the Line 9B ROW was inspected at these frequencies, which includes inspection of not only the 447 km of HCAs but also the 197 km of ROW that does not directly impact an HCA.

<sup>1</sup> Filing ID A53890.

### 3. ENHANCED GROUND PATROL MEASURES

To fulfill the requirements of Order MO-045-2015, Enbridge will implement an enhanced ground patrol plan. Enbridge's enhanced ground patrol plan will include: continued physical surveillance of stations and terminals; an increase in physical surveillance of the valve sites; an increase in frequency of helicopter patrols; and piloting the use of thermal camera technology on helicopter patrols.

#### a) Station and terminal surveillance

As part of the enhanced ground patrol plan, Enbridge will continue to visually inspect its stations and terminals for leaks at least twice a week. Enbridge's Control Center will also continue its 24/7 monitoring of the pipeline, stations, and terminals.

#### b) Valve site surveillance

Enbridge's enhanced ground patrol plan will include an increase in the frequency of valve site visual inspections by technicians to once every two weeks for both remote controlled and manual valves.

#### c) Increased frequency of helicopter patrols and use of a thermal camera

Enbridge will increase the frequency of helicopter patrols along the entire Line 9B ROW from once every two weeks to twice per week. The helicopter will fly from North Westover to Montreal, along the Line 9B ROW, in both directions. This will increase Line 9B ROW surveillance by a factor of four on a bi-weekly basis from its current practice. Enbridge will survey portions of the Line 9B ROW that include directly impacted HCAs (totaling approximately 447 km) and also the portions of the line that do not include directly impacted HCAs (totaling approximately 197 km).

To further enhance Enbridge's ground surveillance strategy, Enbridge will equip its helicopter with a thermal camera, which will be used on alternate weeks to survey the Line 9B ROW. This technology would be used to explore areas of interest on the ROW identified by the pilot in order to delineate temperature irregularities, which may indicate a potential release of product. This thermal camera technology is currently under evaluation as part of a broader test program.

There are many advantages associated with using a helicopter for ground patrols, compared to visually inspecting the pipeline when physically on the ground, including improved surveillance and leak detection, and minimizing impacts to landowners, the environment, and the safety of Enbridge employees and contractors.

#### i. Improved surveillance and leak detection

By combining ground based visual inspection with increased helicopter patrols of the Line 9B ROW, the ground patrol plan will provide a comprehensive program that enhances overall surveillance and leak detection. Surveilling the ground with a helicopter provides an expansive and less obstructed view of the Line 9B ROW, increasing the efficiency of Enbridge's ground patrol. Ground patrol by helicopter allows the helicopter pilot to survey both the pipeline ROW

and the surrounding terrain. In doing so, the pilot can determine if oil is surfacing in areas away from the pipeline. Patrolling by helicopter also allows for a comprehensive review of geotechnical and hydrological issues in the area of the pipeline that may impact the integrity of the line.

Helicopter patrol is also an effective method for detecting unauthorized third party activity on or near the pipeline. Third party strikes on the pipeline are a significant industry wide issue and one of the major causes of pipeline leaks. Using a helicopter for ground patrol is an effective way to detect unauthorized third party activity that is not readily visible from the ROW itself and helps proactively prevent pipeline incidents resulting from such activity. The increased frequency of ground patrols by helicopter better positions Enbridge to detect these activities before they can damage the line.

Surveying the HCAs along the pipeline ROW while physically on the ground is not as effective as a helicopter patrol. When surveying on the ground, there is a limited area that can be observed – typically only the ROW immediately around where one is patrolling. The view from the ground can also be obstructed by tall vegetation or the topography of the land. It is therefore more difficult to detect leaks from the ground, or to discover third party damage that may impact the integrity of the line, than it is from a helicopter. Patrolling on the ground is also subject to further obstacles, which are discussed in more detail below under landowner, environmental, and safety impacts.

ii. Landowner, environmental, and safety impacts

Performing ground patrol by helicopter will result in fewer impacts on landowners, the environment and the safety of Enbridge employees and contractors. Some of the issues that are mitigated by using a helicopter as the primary method for ground patrol are set out below.

Landowner considerations

Landowners may be reluctant to allow Enbridge personnel and contractors to physically access and cross their lands every two weeks. As an example, the land may have crops that cannot be traversed without loss or damage; or traversing commercial or industrial lands, like a golf course, may disrupt routine operations especially given the frequency of the patrols. Residential landowners may also have privacy concerns associated with having Enbridge employees and contractors on their land every two weeks.

Environmental considerations

The Line 9B ROW has environmentally sensitive areas that would be unnecessarily damaged from frequent patrols carried out on the ground. As an example, the Line 9B ROW includes marshy lands that cannot be crossed without using all-terrain vehicles and use of these vehicles may cause damage to environmentally-sensitive areas. Additionally, some areas of the Line 9B ROW are not physically traversable, including deep drainage ditches with steep sides and water ways that cannot be forded and would be patrolled from the shoreline only.

Safety considerations

There are significant safety issues associated with surveillance of the pipeline from the ground. Enbridge employees and contractors may be at risk due to hunting areas on and adjacent to the

ROW. Additionally, the following conditions present a significant safety concern for Enbridge employees and contractors or make it impossible to perform the patrol every two weeks: inclement weather conditions such as storms, hail, extreme heat, lightning, or extreme winds; or winter conditions including blizzards, snow drifts, snow-covered fields, thin ice, muddy terrain and poor visibility. It is also unsafe for Enbridge employees and contractors to cross public highways, railways, or other transit corridors along the ROW. Agricultural chemicals applied to crops during the spring, summer, and fall seasons present significant health concerns to ground patrols. Further safety considerations include unnecessary exposure to noxious weeds and harmful insects.

#### **4. CONCLUSION**

Enbridge respects the privacy and rights of the landowners along the Line 9B ROW and the ground patrol plan ensures that undue burden and inconvenience is avoided while providing increased leak detection assessments of the pipeline. The considerations described in the ground patrol plan illustrate some of the difficulties in obtaining an unobstructed view of the ROW when using surveillance methods from the ground, and potentially significant impacts on landowners, the environment and the safety of Enbridge employees and contractors. Conducting ground patrol primarily by helicopter, in addition to visual inspections of Enbridge's stations, terminals and valve sites, addresses these issues and improves Enbridge's ability to detect and respond in the unlikely event of a release.

Enbridge submits that the ground patrol plan meets and exceeds the goals of condition 4.a. of Order MO-045-2015 and the directions in the June 18 Letter. It will increase the surveillance of Line 9B, from North Westover to Montreal, provide a complete and extensive view of the ROW and surrounding areas, respect landowners, protect the environment and ensure the safety of Enbridge employees and contractors.